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10/666,729	09/18/2003	Foster D. Hinshaw	3336.1016-001	6049

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EXAMINER

FLEURANTIN, JEAN B

ART UNIT	PAPER NUMBER
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2162

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08/09/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/666,729

Applicant(s)

HINSHAW ET AL.

Examiner

JEAN B. FLEURANTIN

Art Unit

2162

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is in response to the preliminary amendment filed on 1/16/2004.

Claims 1- 47 are presented for examination.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 5/26/2006, 6/23/2004, 1/16/2004 and 9/18/2003. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

The Drawings submitted on 1/16/04 are acknowledged.

Specification / Claim Objections

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The claimed "software operator" as recite in claim 1, line 16; claim 8, line 1; claim 30, line 26 and claim 34, line 2.

Further, see MPEP 608.01 and 2173.

The abstract, page 65, is objected because the "Title" should not be into the same page. Appropriate correction is required.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent Application No. 10/666,729. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to the patent Application No. 10/666,729 claim 1 to interchangeably "host computers" to "host processors" in order to provide multi-group computer architecture in which multi computers are connected by a network; see patent Application No. 10/666,729.

Claim 1 of U.S. patent Application No. 10/666,729 contain(s) every element of claim 1 of instant applications serial No. 10/668,113 and 10/667,128 and thus anticipate the claim 1 of the instant application. Claim 1 of the instant application therefore is not patentably distinct from the earlier patent application claim 1 and as such as are unpatentable over obvious-type double patenting. A later patent/application claim is not patentably distinct from an earlier claim if the later claim is anticipated by the earlier claim.

Instant application 10/666,729	10/668,113	10/667,128
<p>An asymmetric data processor comprising: one or more host computers, each including a memory, a network interface and at least one CPU, each host computer being responsive to requests from end users and applications to process data;</p> <p>one or more Job Processing Units (JPUs), each having a memory, a network interface, one or more storage devices, and at least one CPU, each JPU being responsive to requests from host computers and from other JPUs to process data;</p> <p>a network enabling the host computers and the JPUs to communicate between and amongst each other, each of the host computers and JPUs forming a respective node on the network; and</p> <p>a plurality of software operators that allow each node to process data in a record-by-record, streaming fashion in which (i) for each operator in a given sequence of operators, output of the operator is input to a respective succeeding operator in a manner free of necessarily materializing</p>	<p>An asymmetric data processor comprising: a first group of nodes comprising one or more host processors, each host comprising a memory, a network interface, and one or more Central Processing Units (CPUs), wherein each host accepts and responds to queries for data, and transforms such queries into one or more jobs;</p> <p>a second group of nodes comprising one or more Job Processing Units (JPUs), wherein each JPU comprises: a memory, for storing data a network interface, for receiving data and instructions a streaming data interface, for receiving data from a streaming data source;</p> <p>one or more general purpose CPUs, for responding to requests from at least one host computer in the first group, and to requests from other JPUs in the second group, and</p> <p>one or more Programmable Streaming Data Processors (PSDPs), which perform primitive functions directly on data received from the streaming data interface, each PSDP thus performing initial processing on a set of data; and a network connecting the nodes within each</p>	<p>An asymmetric data processing system comprising: a first group of one or more host computers, each comprising a memory, a network interface and one or more Central Processing Units (CPUs), each host computer accepting and responding to requests to process data;</p> <p>a second group of two or more Job Processing Units (JPUs), operating autonomously and asynchronously from one another, each JPU consisting of a memory, a network interface, a data interface with exclusive access to one or more sources of data, and</p> <p>one or more general purpose CPUs, each JPU in the second group being responsive to requests received from a host computer to execute jobs, the jobs containing instructions for the processing of a particular subset of data under the JPU's exclusive control; and</p> <p>a network connecting the network interfaces within each group and between the two groups.</p>

data, and (ii) data processing follows a logical data flow and is based on readiness of a record, such that as soon as a subject record is ready record data is passed for processing from one part to a next part in the logical data flow, the flow of record data during data processing being substantially continuous so as to form a stream of record processing from operator to operator within nodes and across nodes of the network.	group and between the two groups, and wherein a JPU receives jobs from one or most nodes in the first group, performs work requested by the job, and forms a reply.	
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"A later patent claim is not patentably distinct from an earlier patent claim if the later claim is obvious over, or anticipated by, the earlier claim. In re Longi, 759 F.2d at 896, 225 USPQ at 651 (affirming a holding of obviousness-type double patenting because the claims at issue were obvious over claims in four prior art patents); In re Berg, 140 F.3d 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998) (affirming a holding of obviousness-type double patenting where a patent application claim to a genus is anticipated by a patent claim to a species within that genus)." ELI LILLY AND COMPANY v BARR LABORATORIES, INC., United States Court of Appeals for the federal Circuit, ON PETITION FOR REHEARING EN BANC (DECIDED: May 30, 2001).

Accordingly, absent a terminal disclaimer, claims 1 and were properly rejected under the doctrine of obviousness-type double patenting." (In re Goodman (CAFC) 29 USPQ2d 2010 (12/3/1993).

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 30-47 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As set forth in MPEP 2106:

As per independent claim 30

The independent claim 44 is directed to a method of data processing, in which data processing follows a logical path formed of node locations. Therefore, the mechanism for assigning specific tasks to specific processors, with a master processor controlling the system, this specialization has a number of benefits, resources can be dedicated to specific tasks, avoiding the overhead of coordinating shared access as the purpose of the invention. The claimed subject matter lacks a practical application of a judicial exception (law of nature, abstract idea, naturally occurring article/phenomenon) since it fails to produce a useful and tangible result.

All the dependent claims are rejected under the same rational.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12, 14-38 and 40-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,507,834 issued to Kabra et al., ("Kabra") in view of USPN 7,191,169 issued to Tao ("Tao").

As per claim 1, Kabra discloses "an asymmetric data processor comprising: one or more host computers, each including a memory, a network interface and at least one CPU, each host computer being responsive to requests from end users and applications to process data" (i.e., user interface, SQL queries, transforms query into extended SQL syntax and transmits to data server; see col. 9, line 66 to col. 10, line 5);

"one or more Job Processing Units (JPUs), each having a memory, a network interface, one or more storage devices, and at least one CPU, each JPU being responsive to requests from host computers and from other JPUs to process data" (i.e., transmission control protocol or message passing interface can be utilized to transfer the information, the communication is between processors on a symmetric multiprocessing system, memory used as the transport vehicle; see col. 7, lines 19-26 & Fig. 1);

"a network enabling the host computers and the JPUs to communicate between and amongst each other, each of the host computers and JPUs forming a respective node on the network" (i.e., transmitting over network from one node to another; see col. 9, lines 31-34); "and a plurality of software operators that allow each node to process data in a record-by-record, streaming fashion in which (i) for each operator in a given sequence of operators" (see col. 9, line 66 to col. 10, line 11), "and (ii) data processing follows a logical data flow and is based on readiness of a record, such that as soon as a subject record is ready record data is passed for processing from one part to a next part in the logical data flow" (see col. 8, lines 9-16), "the flow of record data during data processing being substantially continuous so as to form a stream of record processing from operator to operator within nodes and across nodes of the network" (i.e., using network streams across a communication network via a transport protocol for transmitting data; see col. 7, line 61 to col. 8, line 3).

Kabra fails to explicitly disclose output of the operator is input to a respective succeeding operator in a manner free of necessarily materializing data. However, Tao discloses output of the operator is input to a respective succeeding operator in a manner free of necessarily materializing data (see Tao col. 9, lines 36-42). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the process of Kabra by respective succeeding operator in a manner free of

necessarily materializing data as disclosed by Tao (see Tao col. 9, lines 47-50). Such a modification would allow the process of Kabra to provide date view data, when the base tables of a materialized view are modified, corresponding changes are made to the materialized view, lead to a cost saving (see Tao col. 3, lines 27-36), thereby, improving the accuracy of the asymmetric streaming record data processor method and apparatus.

As per claim 2, Kabra discloses "the record data in the stream of record processing may exist in various states at different parts in the data flow, and the parts in the logical data flow include on disk storage, within JPU memory, on the network, within host computer memory, and within an ODBC connection with an end user or application" (see col. 14, lines 46-57).

As per claim 3, Kabra discloses "the plurality of operators includes a merge aggregation operator that determines record readiness based on a key index value, such that the merge aggregation operator aggregates a sorted record stream and outputs the aggregation associated with a current key index value whenever a new key index value is received as input" (see col. 8, lines 25-42).

As per claim 4, Kabra discloses "record readiness is determined by buffer status such that a communication layer sends a partial set of records across the network when its buffers are filled, without waiting for a working sequence of operators that produced the record data to complete before any records are sent across the network" (see col. 14, lines 46-57).

As per claim 5, Kabra further discloses "at least one programmable streaming data processor (PSDP) coupled to a respective JPU, the PSDP being one part in the logical data flow and processing data fields within records as buffers of records are received from a storage disk or an external network connection, without waiting to process any records until all records are received" (see col. 12, line 54 to col. 13, line 24).

As per claim 6, Kabra discloses "the data fields are processed by the PSDP to produce virtual fields" (see col. 16, lines 14-15).

As per claim 7, Kabra discloses "the virtual fields are selected from a group consisting of: a row address, pad words (tuple scratch pad), a Boolean results from each of the filter operations, a hash result, a tuple null vector, a tuple length, and combinations thereof" (see col. 8, lines 17-23).

As per claim 8, Kabra discloses "each software operator follows a common data handling paradigm such that each operator can operate in any part of the logical data flow, the common data handling including each operator being able to accept one or more streams of record data as inputs and producing a stream of record data as an output" (see col. 9, lines 60-65).

As per claim 9, Kabra discloses "any operator may take as its input a stream of record data that is produced as the output of any other operator" (see col. 7, line 66 to col. 8, line 1).

As per claim 10, Kabra discloses "certain ones of the operators materialize data and do so as sets of records" (see col. 8, lines 33-37).

As per claim 11, Kabra discloses "the operators further enable same algorithms to be used for a given operation whether that operation is executed on the host computers or on the JPUs" (see col. 7, line 61 to col. 8, line 16).

As per claim 12, in addition to claim 1, Kabra further discloses "record data are processed at intermediate parts on the logical data flow" (see col. 8, lines 6-9).

As per claim 14, Kabra discloses "the JPU's CPU eliminates unnecessary data before it is sent across the network" (see col. 8, lines 63-65).

As per claim 15, Kabra discloses "at least one of the host computers eliminates unnecessary information before processing a next step of a subject query" (see col. 16, lines 5-6).

As per claim 16, Kabra discloses "the host computers further include a Plan Generator component, the Plan Generator component generating record data processing plans having operations which take input streams of record data and produce streams of record data as output and which avoid intermediate materialization" (see col. 16, lines 10-15).

As per claim 17, Kabra discloses "the host computers further include a Communication Layer API that accepts data records as input to a message sent to one or more other nodes" (see col. 11, lines 24-29).

As per claim 18, Kabra discloses "the host computers further include: a Job Listener component for awaiting data from other nodes; and an API which provides streams of record data as output" (see col. 9, lines 60-65).

As per claim 19, Kabra discloses "the host computers further comprise a Host Event Handler component for managing execution of a query execution plan, the Host Event Handler receiving partial result sets from JPUs through the Job Listener component" (see col. 9, lines 9-37).

As per claims 20 and 21, Kabra discloses "the host computers further comprise a Host Event Handler for managing execution of a query execution plan, the Host Event Handler communicating to JPUs through a Communication Layer component to request partial result sets from JPUs" (see col. 9, lines 27-51).

As per claims 22 and 23, in addition to claim 1, Kabra further discloses "performs multiple operations on each field value in turn while each field value is held in a host CPU cache" (see col. 7, lines 19-26).

As per claims 24 and 25, Kabra discloses "the JPUs separate the stream of record processing from source of the record data such that various input sources to the JPUs are permitted" (see col. 11, lines 50-54 and Fig. 6A).

As per claim 26, Kabra discloses "the JPUs further comprise a Network Poster component which accepts a stream of record data as input and which sends data to other nodes when its buffers are filled, when jobs are completed or upon an explicit request to do so" (see col. 11, lines 5-16 and Fig. 5).

As per claim 27, Kabra discloses "the JPUs further comprise a Storage Manager component whose API and implementation provide for storage and retrieval of record sets" (see col. 5, lines 29-37).

As per claims 28 and 29, Kabra discloses "the host computers are of a symmetric multiprocessing arrangement and the JPUs are of a massively parallel processing arrangement" (see col. 5, lines 27-34).

As per claims 30-38 and 40-47, the limitations of claims 30-38 and 40-47 are similar to claims 1-12 and 14-29, therefore, the limitations of 30-38 and 40-47 are rejected in the analysis of claims 1-12 and 14-29, and these claims are rejected on that basis.

Claim Objections / Allowable Subject Matter

Claims 13 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 1/6/2004 have been fully considered but they are not persuasive. Because of the 35 U.S.C. 101 and 103 claims rejections.

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Singh et al., USPN 6,477,540 relates to systems and methods for performing queries on data stored in a database.

CONTACT INFORMATION

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEAN B. FLEURANTIN whose telephone number is 571-272-4035. The examiner can normally be reached on 7:05 to 4:35.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BREENE can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jean Bolte Fleurantin

Patent Examiner

Technology Center 2100

August 2, 2007

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :5/26/2006, 6/23/2004, 1/16/2004 and 9/18/2003.